

Remarks

The Office Action

The Examiner:

(a) objects to the drawings;

(b) objects to the multiple dependency of claims 3, 5 – 10 as depending from multiple dependent claim 2;

(c) rejects claims 2, 4, 12 under the written description requirement of Section 112 based on the premise that the leaf springs described in the specification and shown in the drawings will not be understood to have surfaces and edges;

(d) rejects claim 4 as indefinite under Section 112;

(e) rejects claims 1, 2, 4, and 12 as obvious based on Applicant's own

Barth 5269497 in view of US Patent 3248745 to Gunlock and US Patent

6158815 to Sugie et al

(f) rejects Claim 11 as obvious over Applicant's own US Patent 5269497 to Barth in view of Gunlock and Sugie et al. and further in view of Applicant's own US Patent 3156460 to Santillo.

Argument

It is respectfully submitted that the formal objections are met as described below and, for the reasons discussed below, the claims are nonobvious as those references would not be combined because they teach away from one another.

Drawings

The Examiner's careful review is appreciated; the corrected sheet shows reference number 70 for the helper spring.

With respect to the parallel surfaces, Applicant respectfully disagrees. It is believed that anyone of ordinary skill, when seeing the drawings and reading the written description referencing such things as a "leaf spring" and having "flat" or "substantially flat" portions, will understand that the structure is of a rectangular section, formed as a bar or plate of constant thickness, as opposed to a wire, rod or some sort of tapered structure. These principles are apparent in the

specification in numerous places -- "leaf spring" or "leaf" (*passim*), "flat springs" (paragraph 30) and the comparison to wire made in paragraph 31.

An inspection of the drawings, such as Fig. 1 and Fig. 5 show that the leaf springs have thickness, and it is constant, and have a rectangular section – looking at the ends. This is consistent with terminology such as Marks' Standard Handbook for Mechanical Engineers, Ninth Ed., page 8 – 71 that discusses, *inter alia* "rectangular plate springs" and mentions:

"The strength and deflection of single-leaf flat springs of various forms are given (Bruce, Am. Mach., July 19, 1900) by the formulas  $h = a l^2 / f$  and  $b = c \pi l / h^2$ " (emphasis added).

The drawings show parallel surfaces and it is clear that parallel surfaces and edges will be understood by one of ordinary skill. The specification supports this. The understanding of "substantially parallel" will be discussed below in connection with the claim language.

#### Multiple Dependency

The Examiner's careful review of the claim dependency is appreciated.

Claims 3, 5 -10 have been amended to cancel dependency from claim 2.

#### Written Description – 35 USC § 112 - Substantially Parallel

The Examiner rejects claims 2, 4 and 12 insofar as they limit the leaf springs to having substantially parallel surfaces and edges. As pointed out with respect to the drawings, these properties are shown and described. Flat leaf springs are known to one of ordinary skill to have parallel surfaces and edges, unless other properties (triangular shape or taper) are specifically described. Marks, *supra*.

Substantial parallelity is not the absolute that the Examiner is mandating. Numerous decisions uphold the use of "parallel" in the context of real world structures that do not necessarily match abstract concepts in the discipline of Geometry.

"The term "substantially parallel" means just that. It does not mean exactly parallel. See *Panduit Corp. v. Stahlin Bros. Fibre Works, Inc.*, 338

F.Supp. 1240, 1243-1244, [172 USPQ 650] (W.D. Mich. 1972), aff'd 476 F.2d 1286 [178 USPQ 12] (6th Cir. 1973)." *Maitland Co. Inc. v. Terra First Inc.* 33 USPQ2d 1882, 1888 (D SC 1994)

Curves may be substantially parallel: "If Boman's curve design is viewed from this perspective, the series of lines composing the transmission line would be substantially parallel within the coverage of claim one." *Chaparral Industries Inc. v. Boman Industries Inc.* (DC CCalf) 7 USPQ2d 1789

*Advanced Cardiovascular Syst. Inc v. Scimed Life Syst. Inc.* 261 F3d 1329, 59 USPQ 2d 1801 (Fed Cir 2001) held "generally parallel" to be enforceable, where parallelism relative to an axis was the issue, vacating Summary Judgment of noninfringement because whether or not there was a parallel relationship in the same plane of reference was unclear based on intrinsic evidence.

To the extent the Examiner's position is that a "W arch" cannot have parallel surfaces because it is curved, and therefore if surfaces were extended to infinity, they would intersect, similar language to that used here was upheld in *C.P. Partnership v. Far West Products* 49 USPQ2d 1734 (WD La, 1998): "parallel coplanar, horizontally disposed hot air flow channels in a modified "S" configuration" (US Patent No. 4848317) Substantially parallel surfaces in a "W arch" are equally well understood by one of ordinary skill.

In a seating case, *Hassel v. Chrysler Corp.* 43 USPQ2d 1554 (SD Ohio 1997) "Claim One also includes "an armrest guard encircling the second cushion position when unfolded substantially parallel therewith . . . and substantially vertical when folded." The court found no infringement because there was no armrest guard at all on the accused product, but there was no problem interpreting something to be "substantially parallel" and also "encircling".

There is ample reason to conclude that a person of ordinary skill will understand the nature of substantially parallel surfaces and edges in leaf springs based on the drawings and specification.

Obviousness Rejections

It is respectfully submitted that the limitations in the claims, currently supported by the drawings and specification, as pointed out herein, are not obvious in light of the primary references cited and the components selected from the additional references. In part, Applicant wishes to emphasize that its distinctions regarding the additional references are not simply an argument that all features should be in the references, but rather that because the references teach different solutions in different environments, they would not be combined by one of ordinary skill.

Indeed, the teaching away by Applicant's own Santillo provides a good basis for this explanation. Santillo and Barth provide particularly good examples of the scope and content of the prior art, level of skill and differences in the claimed seat over the prior art because they are Applicant's own art. Santillo shows an earlier embodiment of leaf spring seating. Because of the nature of the loads in home furnishing, and related styles (RV furniture and marine seating can be largely like home furnishing because they do not have the space, driver control, and crashworthiness standards as would automotive driver and passenger seats) and needs for adaptability to receive various upholstery and mechanism styles and the need to be long lasting, leaf springs have unique attributes. They perform many functions well, but as noted in the specification, paragraph 33, when subjected to twisting loads – from the way a person sits, unlike an automobile driver seat where the occupant is strapped in place – and earlier, narrower, prior art springs had fatigue difficulties. Thus, Santillo's solution was to add paired leaf springs. These reinforce, but do not materially change the load supporting properties.

Barth used a pair of V arches to improve properties, including a central ridge between them, and effectively "doubling" the leaf springs by putting them in pairs proximate one another. Thus, the obviousness issue is whether one of ordinary skill with Barth would look into a "box of parts" and pick out and combine, as the Examiner suggests, regarding claims 1, 2, 4, and 12:

(1) Gunlock's "col. 2 lines 22-25 ... seat spring assembly wherein each spring has a V arch adjacent a first end of the spring and a W arch adjacent a second end of the spring" and

(2) Sugie's "figure 8 ... use of a seat spring assembly including a cross piece 24, the cross piece spanning and substantially perpendicularly interconnecting second ends of leaf springs 22, the leaf spring second ends being attached to the cross piece, and a plurality of coil springs, the coil springs connecting the cross piece to a frame end 20 to transmit loads from the interconnected leaf springs through the coil springs to the second frame end."

Applicant submits that the person of ordinary skill would not look into these boxes of parts, because the components taught by these references are structurally and functionally different.

While Gunlock uses "W shaped supporting structure 32", the numbers appearing in the plan view, Fig. 1 and perspective view, Fig. 6, but Applicant does not see it in the views that show a W "shape". Presuming it is there, it is still a bent wire "supporting structure." An arch is something completely different. An arch is supported at two ends, along an axis. If an arch were designed to be supported at displaced points (like Gunlock) it would twist (like Gunlock) and whether a traditional arch or a beam arch, it would fail dramatically. As pointed out in connection with the "parallel surfaces" point, and the relationship to "leaf" springs that are "flat" these react so far differently, that no one would think to combine a twisted wire taught by Gunlock – Gunlock uses "W" but not "arch" for very material and significant reasons.

While it may be correct that Gunlock need not teach leaf springs to be legally combinable, Gunlock must still be a reference that one of ordinary skill would combine. Because Gunlock uses a much different approach – bent wire torsion springs that look like a "W" only if you are looking at a particular elevation – it is not fairly combinable. One of ordinary skill would not have looked to Gunlock to solve the problem of twisting (specification, paragraph 31). One of ordinary skill would not have looked in this box of parts.

Sugie is another patent that teaches a structure adapted to specific needs. Sugie more precisely "tunes" the dynamics of the seat, putting coil springs on the sides of a wire, upholstery supporting grid, and specifically noting the need to control for harmonics (col. 3 lines 5 – 51). Sugie also notes the problem of the thin longitudinal wires 22 (col. 4, lines 59 – 60) causing wear and uses "nonwoven fabric 18" bonded on the foam padding, the same reason Gunlock uses fabric on the sinuous wire springs.

The Examiner states: "Sugie et al. teach in figure 8 the use of a seat spring assembly including a cross piece 24, the cross piece spanning and substantially perpendicularly interconnecting second ends of leaf springs 22, the leaf spring second ends being attached to the cross piece, and a plurality of coil springs, the coil springs connecting the cross piece to a frame end 20 to transmit loads from the interconnected leaf springs through the coil springs to the second frame end." (emphasis added). It is respectfully submitted that Sugie does not have any "leaf springs." To the contrary, column 4, lines 58 – 67 state:

"Specifically, the steel spring 12 is constructed to include numerous thin steel wires 22 arrayed in parallel at a predetermined interval in the longitudinal direction of the seat, three rods 24 arranged at the two right and left ends and at the center of the thin steel wires 22 and extending in the longitudinal direction for connecting the numerous steel wires 22, and a plurality of coil springs 26 for connecting the right and left rods 24 and the frame member 20"

Sugie's steel spring 12 essentially looks like a barbecue grill. All the rods and wires are formed in a grid, bonded to one another and the grid unit flexes and twists as a unit. Its purpose is supporting a particular plastic cushion material and the mode and manner of flexing, and action of the steel spring 12 grid unit the subject of detailed dynamic analysis.

The differences between wire and leaf springs are well understood by Sugie and Gunlock. They do not have leaf springs and there is no reason one would take their all-wire structures and combine them with the leaf springs of Barth.

The Examiner previously found the Sugie structure to be some sort of equivalents to the claimed "cross piece 24" and "leaf springs 22" (Office Action of November 3, 2009, at page 3, paragraph 3). The Examiner more explicitly expresses the conclusion that the "thin steel wires 22" are "leaf springs 22" and that "three rods 24" are "cross piece 24". It is respectfully submitted that no one would disassemble Sugie's grid and take one of the three rods and combine it with leaf spring ends to provide the claimed combination. It is error to say Sugie has "leaf springs" at all, and that is a material error because Sugie's structure behaves quite differently and is formed for quite different purposes – holding up a cushion, not providing a spring function. Despite this, in order to clarify the claim, claim 1 has been amended to add the limitation, "so that said flat leaf springs are supported solely at said first and second ends." Sugie's wire-rod grid teaches away from this limitation because Sugie must use three rods 24 to support thin wires 22.

It is respectfully submitted that no one would find "thin steel wires 22" to be "leaf springs" and no one would find "three rods 24" which are aligned longitudinally against transverse thin wires to be "cross pieces" at the ends of leaf springs.

Further, as pointed out earlier, because Sugie's coil springs and rods are oriented 90° from the claimed coil springs, leaf springs and cross pieces – imagining them rotated about a vertical axis – the rods would not necessarily even be considered "cross" pieces, but rather longitudinals. Sugie's detailed discussion of vehicle seat dynamics teaches us that this kind of orientation is very material.

Sugie's detailed concern about the dynamics of the springs in a vehicle, and the placement of the coil springs aligned transversely also teaches away from the claimed coil springs mounted to cross pieces. Sugie's transverse coil springs are mounted to two of the three longitudinal "rods 24." No one would combine Sugie's wires and rods and transverse coil springs with Barth to put coil springs at the ends of leaf springs and to have cross pieces interconnect the

ends of leaf springs. The person of ordinary skill would not look into Sugie's box of parts to complete the combination.

The only ground for rejection of claim 11 stated is that the helper spring limitation is obvious based on Applicant's previous generation Santillo. It is respectfully submitted that Santillo does not have the elements described by the Examiner. The Examiner states, Office Action, page 7: "Santillo teaches in fig 1 & 2 the use of a helper spring 63". Santillo's specification, however, makes it clear that reference numeral 63 is not "a helper spring" at all:

"The springs 42 and 43 are formed with extensions 60 projecting outwardly beyond the forward portions 45 of 15 said springs. The extensions 60 have spring offsets 61 which are secured to the transverse frame member 29 means of rivets 62. The offsets 61 are connected to the forward ends 45 of the springs 42 and 43 by means of spring connecting portions 63." (Col. 2, lines 13 – 19)

The "portions 63" are part of the main spring 42, 43 and not anything that could be understood to be a "helper spring". This limitation is absent from Santillo.

Even if there were a helper spring in Santillo, which there is not, no structure in Santillo present for varying occupant ride comfort as done with the added helical on the present application. For example Santillo's supplemental spring 46 is added for cushion support in the unsupported area of the seating area in this spring design.

It is respectfully submitted that neither Santillo's "spring connecting portions 63" (the ends of the leaf springs) nor Santillo's "supplemental leaf spring 46" render the claimed helper springs "attached at one helper spring end between the first leaf spring end and the first frame end, and the helper spring other end extending below its respective leaf spring for a length less than the length of the leaf spring".

To more particularly point out the claimed geometry, claims 3 and 11 (both have the helper spring limitation) have been amended to better define the structure projecting below its respective leaf spring and extending for a length

less than the length of the leaf spring. Santillo does not have a helper spring as claimed and does not suggest such a helper spring.

Supplemental Discussion of Previous Arguments

The Examiner distinguishes the previously submitted arguments.

Applicant appreciates the page and line designation in Gunlock as clarifying the use of the term "W", and withdraws its argument that the term "W" is absent. However, Applicant believes Gunlock is not fairly combinable because it teaches away from the combination taught in the present application, not because it is necessarily an inferior solution. It is a different approach and one would not look to bent wires to modify a leaf spring.

With respect to the Examiner's comment regarding Sugie's "sheet spring 12", Applicant similarly believes that Sugie teaches away from and is not fairly combinable with the other references to deny Applicant patentability. Sugie's product in question is not a spring but made of a series bendable, not flexible, wires that force the helical spring on the ends to stretch. Unlike our unit which has two separate items that are allowed to stretch at various rates to address various occupant comfort requirements. The wire system is mainly there for the support of the cushion system and to connect and the helicals on the opposite sides of the seat frame causing them to stretch when weight is applied.

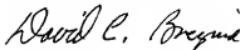
Conclusion

It is respectfully submitted that the cited art neither teaches the claimed limitations nor would the cited art be combined with Barth's leaf spring seat unit. The Santillo – Barth line of development for Applicant's products' using leaf springs in furniture remain commercially novel and involve unique structure considerations. For these reasons, the cited Gunlock and Sugie would not have been looked to for combination with leaf spring art by the person of ordinary skill. The neither teach the elements the Examiner suggests, nor is it fair to combine these different approaches.

This amendment is considered to be responsive to all points raised in the office action. Should the examiner have any remaining questions or concerns,

the examiner is encouraged to contact the undersigned attorney by telephone to expeditiously resolve such concerns.

Respectfully Submitted,



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Attorney for Applicant

David C. Brezina, Reg. No. 34,128

Ladas & Parry, LLP  
224 South Michigan Avenue  
Suite 1600  
Chicago, IL 60604  
312-427-1300